

New Tools for Managing the Department's Geotechnical Data

Geotechnical Services Education Presentation

September 1, 2005

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Overview

- Current practices & motivation for improving data management practices.
- National/International efforts.
- Caltrans efforts.

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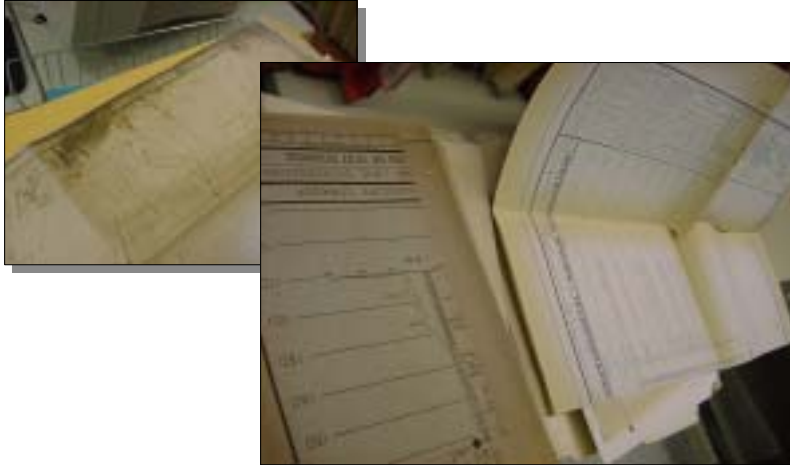
Current Archive System

- 10,000+ project files
- 700,000+ documents
 - Memos
 - Boring logs
 - Reports
 - Test results
 - Photos
- 300 projects/year
- 80+ years of data



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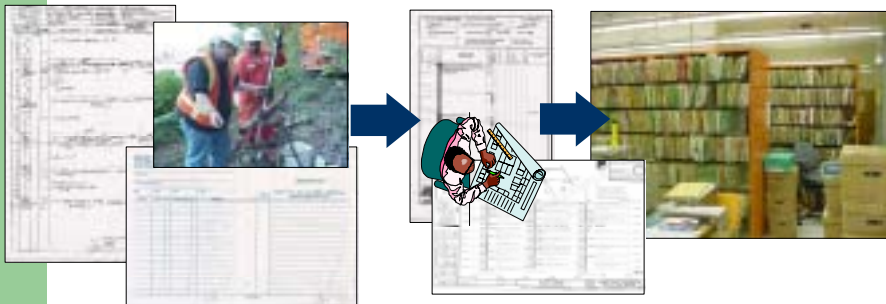
Document Lifespan



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Motivation for Data Management

- Caltrans is primarily a paper-based organization.
- Need more efficient system to manage our investment in geotechnical data.



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Process Issues

- Inefficiencies and errors due to multiple handling of the same information by different functional units.
 - Field staff
 - Office staff
 - Drafting staff
- Non-standard report log formats.
 - Excel, Word, etc.
 - CAD (Microstation)
 - Proprietary Logging Software (gINT, LogPlot, etc)
- No systematic method of archiving of electronic data for retrieval.
 - Microstation files
 - Excel files

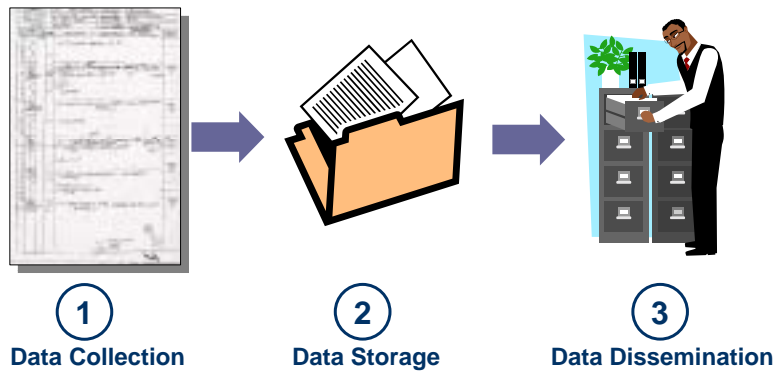
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Archiving Issues

- TransLab filing system based only upon Bridge Number.
- BIRIS not comprehensive.
- Limited availability of files to:
 - Caltrans staff
 - Consultants
 - Other agencies (CGS, USGS, etc.)
- Files are all located at Translab in Sacramento.
- Quality, age, and condition of files vary considerably.
 - Poor photocopies
 - Microfiche photopaper
 - Originals
 - Variations in size

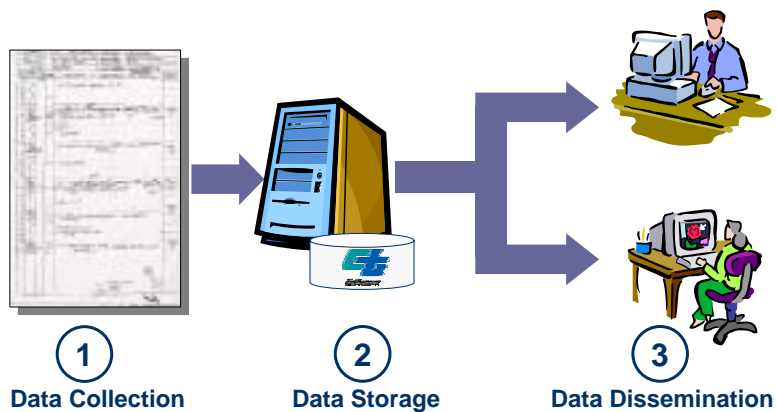
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Data Management Goal



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Data Management Goal



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Data Management Principles

- Record data once.
- Store the data, not just the output products.

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Benefits

- Eliminate inefficiencies and errors due to multiple handling of the same information by different functional units.
- Standardize report log formats.
- Enforce consistency in data collection and management practices.
- Foster systematic method of archiving of electronic data for retrieval.
- Build a data repository that maximizes the Department's ongoing investment in geotechnical data.

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Benefits: Reporting



This screenshot shows a complex data table with numerous columns and rows. The data appears to be organized into sections, possibly representing different stages or components of a project. The table includes various numerical values and categorical labels, providing a comprehensive overview of the reported information.



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Benefits: Visualization & Analysis



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- **National/International efforts.**
- Caltrans efforts.

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Project Participants

Sponsored by:

- [Caltrans](#)
- [California Energy Commission](#)
- [Pacific Gas & Electric](#)
- [PEER-Lifelines Program](#)

In Partnership with:

- [Pacific Earthquake Engineering Research Center](#)
- [United States Geological Survey](#)
- [California Geological Survey](#)

Implemented by:

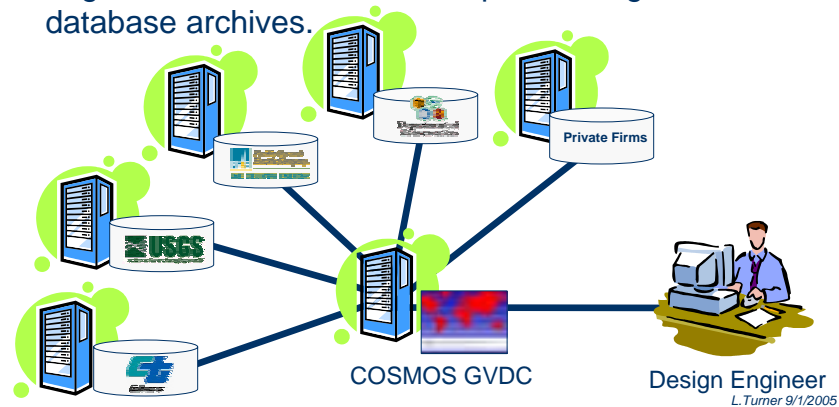
- [University of Southern California](#)
- [Consortium of Organizations for Strong Motion Observation Systems](#)



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Geotechnical Virtual Data Center

- Developed a pilot web-based center for dissemination of geotechnical data from multiple linked geotechnical database archives.

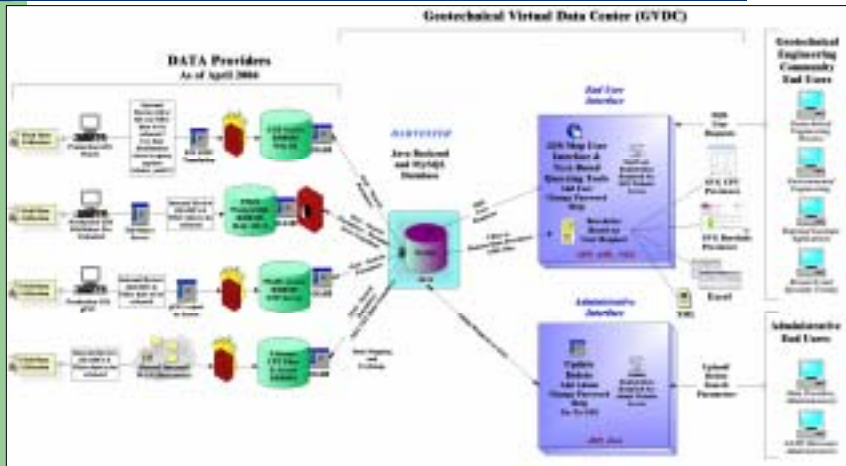


Vision: Multiple Organizations

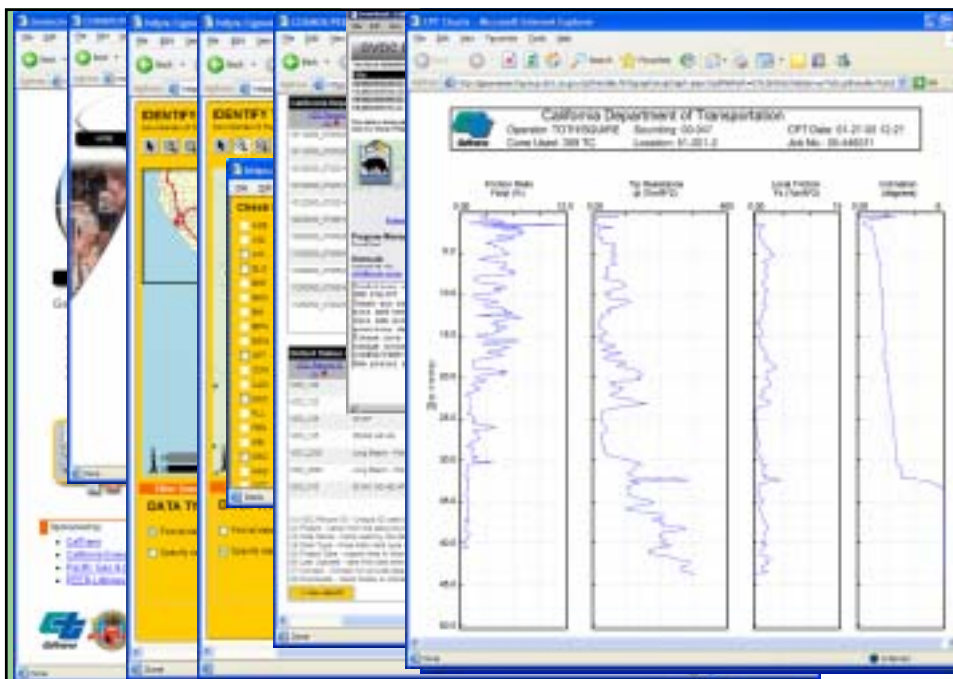


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GVDC System Architecture



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<https://geodata.cosmos-data.org/>

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Overview

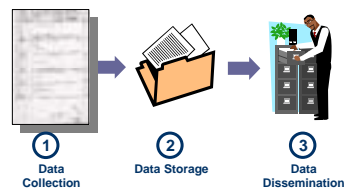
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Processes in Geotech Services

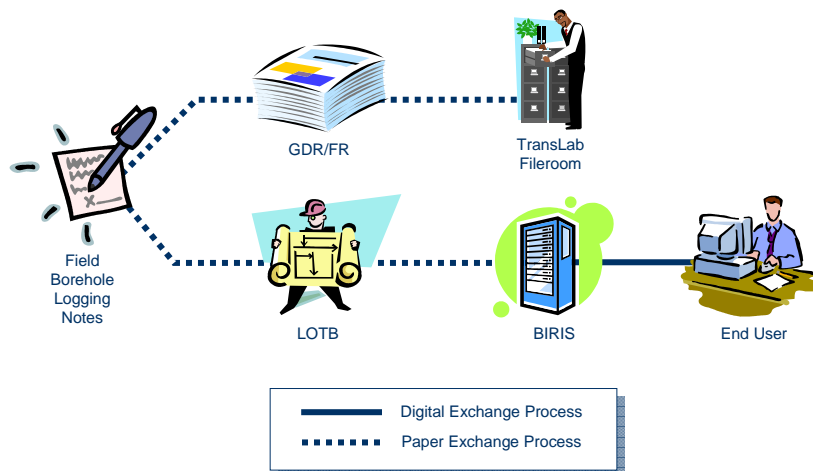
Geotech Services produces a wide range of products for clients that are developed and disseminated without adequately capturing and properly storing the digital data.

- LOTB
- GDR/FR
- Lab Testing
- Geophysics
- Insitu & Instrumentation
- Foundation Testing



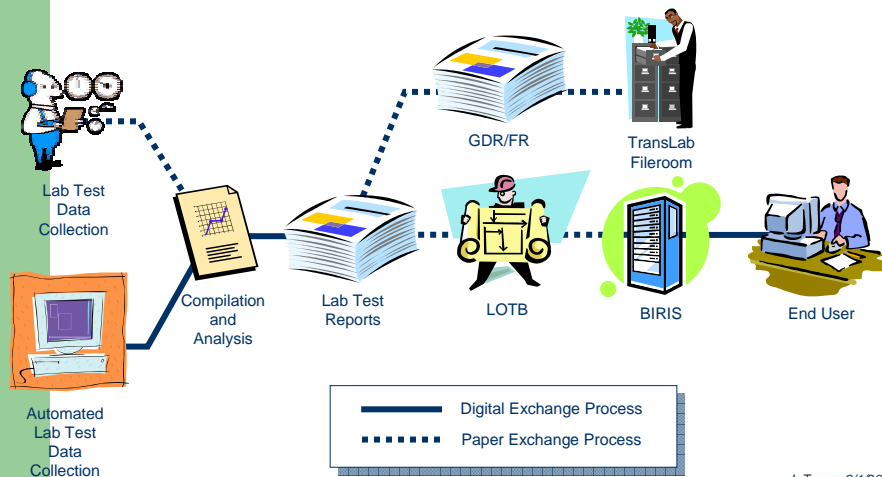
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Data Flow: Boring Logs



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Data Flow: Soils Lab Data



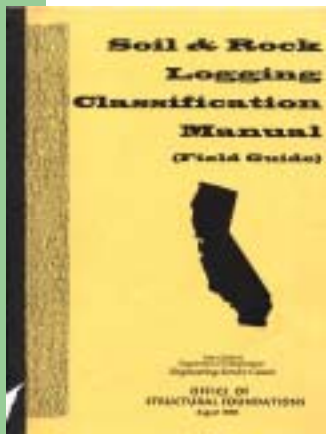
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Current Efforts Underway

- Logging manual
- gINT implementation
- Drafting processes
- Online CPT archive
- Field logging tablet PCs
- Soils Lab data management
- Enterprise data management

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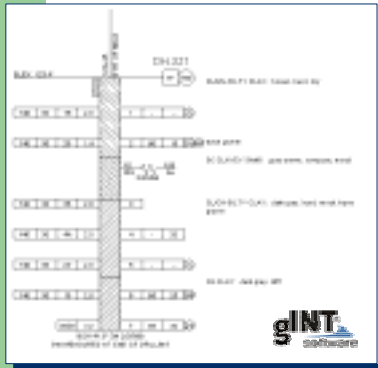
Caltrans Logging Manual



- Update manual to reflect current GS policies and practices.
- Establish standards for logging practice.
- Basis for all other data management efforts.
- Fall 2005 delivery.

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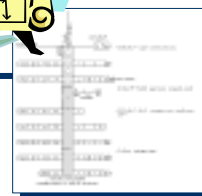
gINT Implementation



- Geotechnical Data Management Committee (GDMC)
- Caltrans currently has 29 licenses.
- GDR and LOTB formats developed.
- Export to Microstation.

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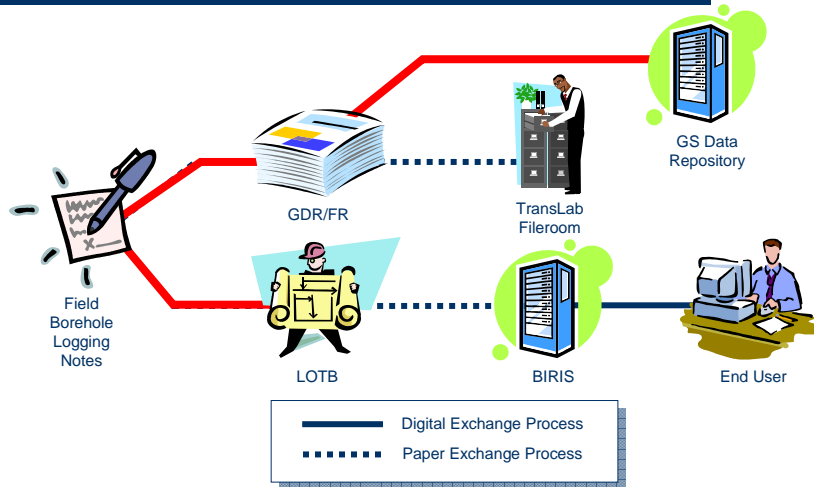
Drafting Processes



- Develop final boring logs in gINT.
- Export to Microstation.
- Create final LOTB.

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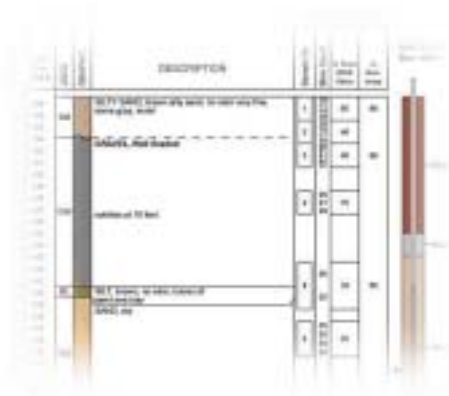
Impacts of gINT and Drafting Process



Field Logging Tablet PCs



Tablet PCs facilitate efficient and consistent field logging practice



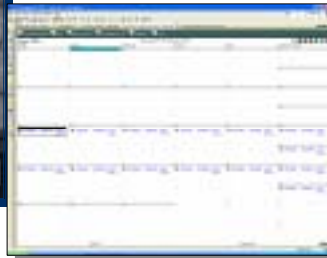
Report-quality products are available to review while still in the field

Field Logging Tablet PCs



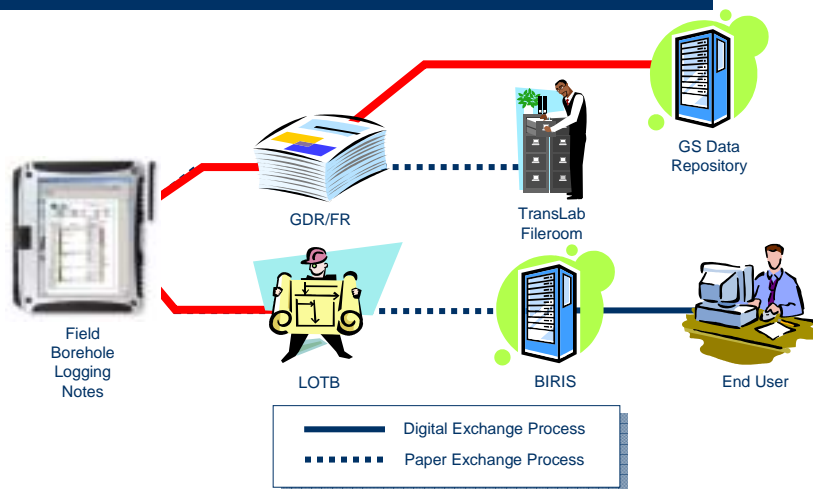
Four tablet PCs are available for use for staff in the Geotech Design Offices for field logging.

Reservation system via Lotus Notes calendar



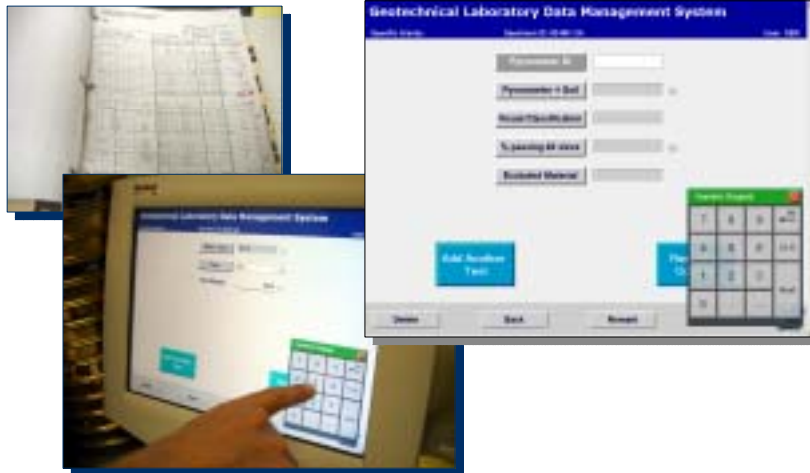
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Impacts of Field Logging Tablets



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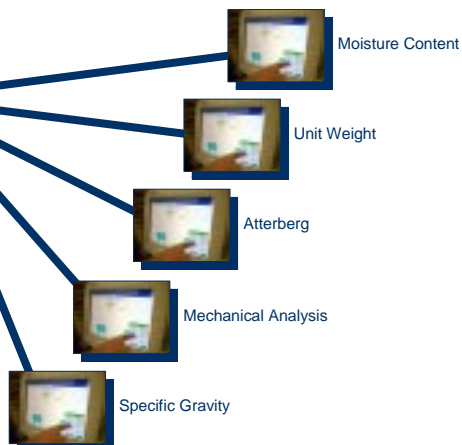
Soils Lab Data Management



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Soils Lab Data Management

Soils Lab Data
Repository



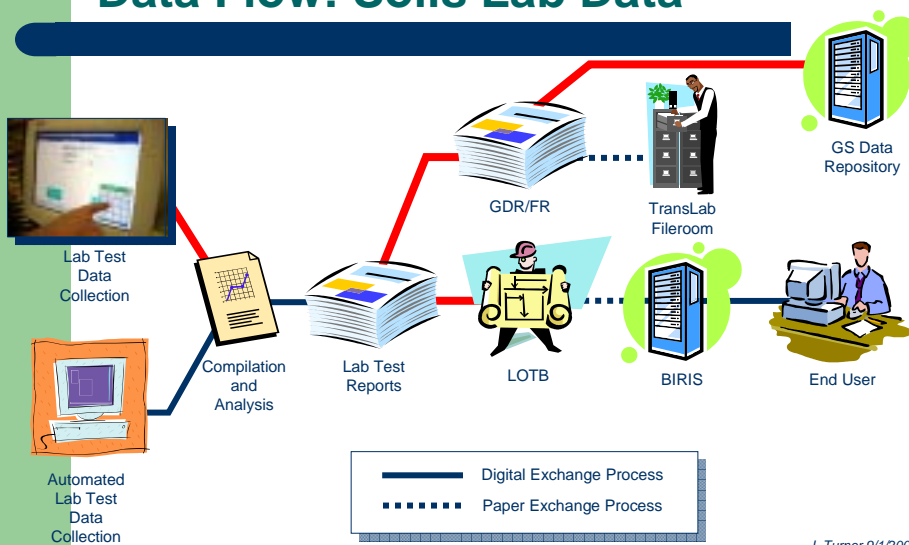
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Soils Lab Data Management

- Phase 1 – Index Properties Tests
 - Moisture Content
 - Unit Weight
 - Atterberg
 - Specific Gravity
 - Mechanical Analysis
- Phase 2 – Strength Tests & Others
 - Triaxial
 - Direct Shear
 - Consolidation
 - Permeability

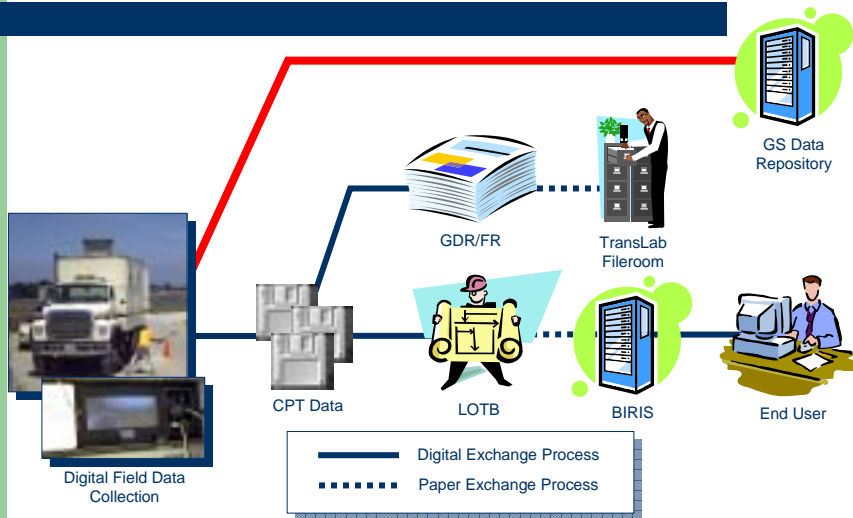
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Data Flow: Soils Lab Data



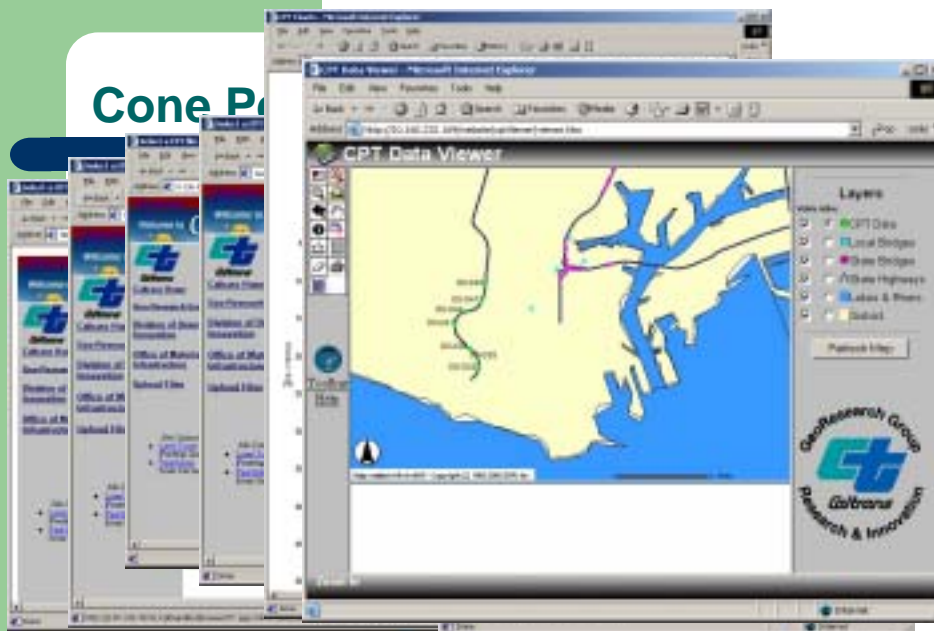
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Cone Penetration Test (CPT)



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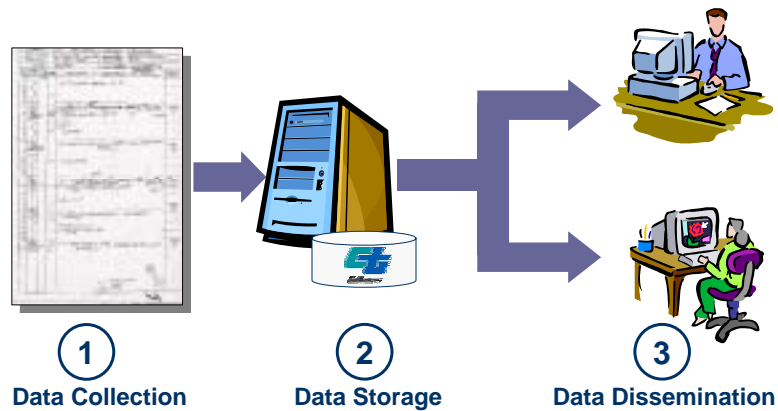
Cone Penetration Test (CPT)



3300+ records, 10 years

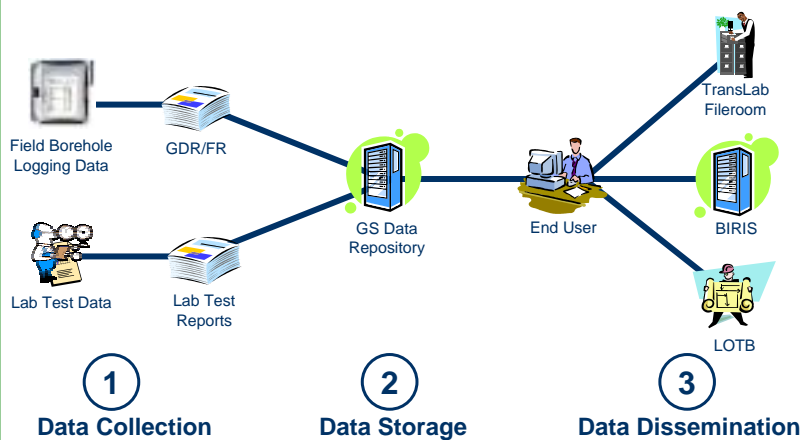
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Enterprise Data Management



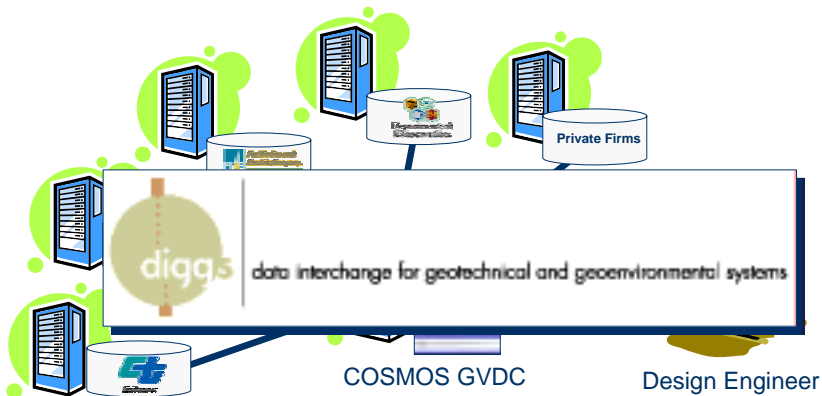
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Enterprise Data Management



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Data Exchange



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